LRQA CERTIFIED ISO 9001

IS40T T STRAINERS

INSTALLATION AND MAINTENANCE INSTRUCTIONS

IMI IS40T.015 E 00.26

GENERAL INFORMATION

- These instructions must be carefully read before performing any work involving VALSTEAM ADCA products. Failure to observe these instructions may result in hazardous situations.
- These instructions describe the entire life cycle of the product. Keep them in a location that is accessible to every user and make these instructions available to every new owner of the product.
- Current regional and plant safety regulations must be considered and followed during installation, operation, and maintenance work.
- The images shown in these instructions are for illustration purposes only.
- For problems that cannot be solved with the help of these instructions, please contact VALSTEAM ADCA or its representative.

VALSTEAM ADCA ENGINEERING S.A

Zona Ind. da Guia
Pav.14 - Brejo
3105-467 Guia, Pombal
PORTUGAL
quality@valsteam.com

CONTENT

1. SAFETY INFORMATION

1.1. Explanation of symbols

DANGER

Hazardous situations which, if not avoided by applying the correct preventive measures, will result in fatal or serious injury and/or considerable property damage.

WARNING

Hazardous situations which, if not avoided by applying the correct preventive measures, could result in fatal or serious injury and/or considerable property damage.

CAUTION

Hazardous situations which, if not avoided by applying the correct preventive measures, could result in moderately severe or minor injury.

NOTICE

Situations which, if not avoided, can result in property damage or product malfunction.

NOTE

Indicates additional informations, tips, and recommendations.

1.2. Intended use

Refer to the markings on the device, such as nameplate and laser markings, Information Sheet (IS) and these Installation and Maintenance Instructions (IMI) to check that the product was designed for the intended use and meets the specifications used for sizing and selection. This includes checking application, material suitability, process medium, pressure and temperature as well as their respective limiting values.

VALSTEAM ADCA does not assume any responsibility for damage resulting from inappropriate use of the product, damage caused by external stresses or any other external factors. Correct installation of the product is the full responsibility of the contractor.

Inappropriate use of the product is any use other than the one described in this chapter. Inappropriate use also includes:

- Use of spare parts that are not genuine;
- Performance of maintenance work not described in these instructions;
- Use outside the limits defined by the accessories connected to the product;
- Unauthorized modifications to the product.

If the product is to be used for an application or with a fluid other than the one it was designed for, contact VALSTEAM ADCA.

1.3. Qualification of personnel

Handling, installation, operation and maintenance work must be carried out by fully trained and qualified personnel, capable of judging the work which they are assigned to perform and recognizing potentially hazardous situations. They should be trained to properly use this product according to these Installation and Maintenance Instructions.

Where a formal “Permits to Work” system is implemented in the plant it must be complied with.

1.4. Personal protective equipment

Personal protective equipment should always be worn during work in order to protect against hazards posed by e.g. the process medium, dangerous temperatures, noise, falling or projected objects and working at height. These equipment includes a helmet, safety glasses, safety harness, protective clothes, safety shoes, hearing protection, etc.

NOTE

Always assess whether you or others in your vicinity require any protective equipment. When in doubt check with the plant’s health & safety responsible personnel for details on required protective equipment.

1.5. The system

The complete system should be assessed as well as every action (e.g. closing of shut-off valves, disconnection of the power supply) to ensure this will not bring additional risk to personnel or property.

Dangerous actions that can result in a hazardous situation include isolation of protective devices such as safety valves, vents, vacuum relief valves, disconnection of electric safety devices, sensors, and alarms.

1.6. ATEX

If the product is in the scope of the ATEX 2014/34/EU directive and as such bears the Ex marking, consult its specific Additional Instructions for use in Potentially Explosive Areas (IMI Ex). In such cases, handling, installation, operation, and maintenance work must only be performed by personnel qualified and authorized to work in potentially explosive areas.

1.7. General safety notes

DANGER

RISK OF BURSTING OR IMPLOSION IN PRESSURE EQUIPMENT

Valves, ancillaries, and pipelines are pressure equipment. Working outside their operating limits, improper opening, malfunction, or system operation failure may result in component bursting or implosion.

- Observe the maximum and minimum operating limits of the product and check if they are within those of the system in which it is being installed. If not, ensure a safety device is included in the system to prevent operation outside those limits. Check the product Information Sheet (IS).
- In case the malfunction of any equipment installed on the system or a system operation failure may result in a dangerous overpressure, overtemperature, or vacuum condition, ensure a safety device is included in the system to prevent such situation.
- Before starting any work on the product, depressurize it and cool or heat it to ambient temperature. This also applies to the line in which it is fitted.
- Drain the process medium from the product and all the relevant plant sections.

WARNING

RISK OF BURNS

Depending on the operating conditions, products and pipelines may get very hot or cold and cause burn injuries.

- Do not touch the product while it is hot or cold, allowing it firstly to cool down or heat up.
- Wear protective clothing and safety gloves during working operation.
- Thermally insulate tubes and products as a preventive measure

WARNING

RISK OF INJURY CAUSED BY FLUID ATTACK ON PRODUCT MATERIALS

The product must only be used with mediums that do not attack the materials of the product (body, gaskets, seals). Otherwise, leaks may occur, and hot and/or hazardous fluid can escape.

- Do not use the product with mediums other than the ones it was designed for. Check section 1.2 - Intended Use.
- Prevent medium contamination.

RISK OF INJURY CAUSED BY UNDER TIGHTENED PRODUCT OR ITS COMPONENTS

Excessively low tightening torques may cause medium to escape and/or components to be projected at high speed, which may result in a hazardous situation depending on the medium, chemical properties and/or its operating conditions.

- Do not loosen any screws while the equipment is pressurized.
- Observe the specified tightening torques on these Installation and Maintenance Instructions. If the relevant torque value is not mentioned, contact VALSTEAM ADCA.

RISK OF HEARING LOSS

Depending on the operating conditions, the product may generate loud noises.

- Wear hearing protection when in the vicinity of the product.

RISK OF INJURY AS A RESULT OF ILLEGIBLE INFORMATION

Important information written in the product nameplate, markings, and warning signs may wear over time or become illegible due to e.g. dirt accumulation, resulting in hazardous situations and personal injury or property damage.

- Keep nameplates, markings, and warning signs in a legible state, replacing them when illegible, missing, or damaged.

CAUTION

RISK OF INJURY DUE TO RESIDUAL PROCESS MEDIUM

Direct contact with a dangerous process medium may lead to personal injury, e.g. smoke inhalation and chemical burns.

- Drain the process medium from the product and all the relevant plant sections.
- Wear protective clothing, safety gloves, mask, and eye protection.

CAUTION

RISK OF INJURY DUE TO IMPROPER HANDLING

Manual handling (e.g. lifting, carrying, pushing, pulling) of large and/or heavy products may result in personal injury.

- Assess the risk associated with the handling task.
- Use adequate handling methods and appropriate auxiliary handling equipment.

NOTICE

RISK OF PRODUCT DAMAGE DUE TO EXCESSIVELY HIGH TIGHTENING TORQUES

High tightening torques may lead to premature wearing of product components.

- Observe the specified tightening torques on these Installation and Maintenance Instructions. If the relevant torque value is not mentioned contact VALSTEAM ADCA.

2. PRODUCT INFORMATION

The ADCA IS40T cast steel T strainers are designed to protect downstream equipment such as steam traps, regulating valves, and piping from dirt and impurities, which are common causes of damage and consequent energy loss in fluid systems.

These strainers, available in carbon and stainless steel, are suitable for use in saturated steam, water, oil, air, and other fluids compatible with the construction materials.

The robust T-shaped body design provides a generous filtration area and low pressure drop, making the IS40T suitable for medium to high-flow applications where reliable particle retention and long service life are required.

The IS40T strainers can be installed in horizontal or vertical position, depending on system requirements, ensuring optimal filtration and easy access for maintenance.

2.1. Principle of operation

The ADCA IS40T T strainer operates by allowing the process fluid to flow through an internal perforated screen, where solid particles and impurities are retained. As the fluid enters the strainer body through the inlet flange, it is directed towards the screen and passes through the mesh surface, while impurities accumulate on the upstream side. Clean fluid then continues downstream, protecting sensitive equipment such as steam traps, valves, and piping.

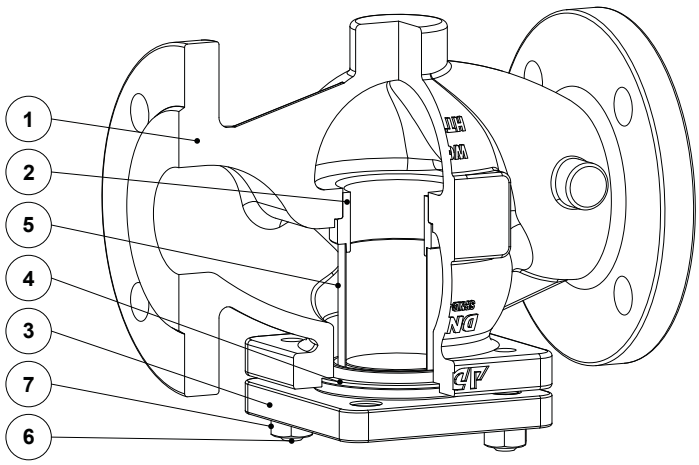

Fig. 1

The T-shaped configuration provides a large filtration area, contributing to stable flow conditions and minimizing pressure loss across the strainer. The operation is entirely passive, relying on the fluid flow to carry solids to the screen surface. Over time, as particles accumulate, the differential pressure across the strainer increases, indicating the need for cleaning.

Maintenance is performed when accumulation of impurities occurs by removing the strainer cap, allowing easy access to the screen for inspection, cleaning, or replacement. For strainers equipped with a drain plug or drain valve, accumulated impurities or condensate can be discharged without removing the cap, reducing maintenance time and system downtime.

The overall performance of the IS40T depends on correct installation, appropriate selection of screen aperture, and regular maintenance to ensure optimal filtration and minimal pressure drop.

The optional drain connection is intended for installation of a blowdown valve to allow safe removal of debris and fluid from the strainer without removal of the screen or depressurization of the entire system.

2.2. Certification

This product has been specifically designed for use with liquids and gases which are in Group 2 of the European PED – 2014/68/EU Pressure Equipment Directive and it complies with its requirements.

CE MARKING – GROUP 2 (PED – EUROPEAN DIRECTIVE)					
PN 16	**PN 25**	**PN 40**	**CLASS 150**	**CLASS 300**	**CATEGORY**
DN 15 to 50	DN 15 to 40	DN 15 to 32	1" to 2"	1"	SEP
DN 65 to 100	DN 50 to 100	DN 40 to 100	3" to 4"	11/2" to 4"	1 (CE marked)

NOTE

If the product falls within the category SEP it must not be CE marked, unless other directives are applicable.

This product is not in the scope of the ATEX 2014/34/EU directive as it does not have its potential ignition source. Personnel responsible for the plant installation must assess the risks caused by static electricity and take the necessary precautionary measures to prevent static charge. These measures include e.g. connection of the product to the equipotential bonding system.

2.3. Product identification

The following items are indicated on the product nameplate or directly on its body:

- Manufacturer
- Product model (e.g. IS40TS)
- Nominal size (e.g. 1")
- Maximum operating pressure (e.g. PMO: 23,8 bar)
- Maximum operating temperature (e.g. TMO: 400 ºC)
- Serial number and year of manufacturing (e.g. Reg.:17483/19)
- CE Marking (when applicable – see section 2.2 – Certification)
- EX Marking (when applicable e.g. EX h IIB T6…T3 Gb – see section 2.2 – Certification)

2.4. Technical data

For technical data including dimensions, materials, limiting conditions and versions refer to the product's respective Information Sheet (IS).

3. TRANSPORT, STORAGE AND PACKAGING

WARNING

RISK DUE TO FALLING LOADS

Loads may tip or fall over resulting in damage to property, serious injury, or death.

- Use suitable equipment when moving or lifting suspended loads.
- Make sure no one is standing below the suspended load.

CAUTION

RISK OF INJURY DUE TO IMPROPER HANDLING

Manual handling (e.g. lifting, carrying, pushing, pulling) of large and/or heavy products may result in personal injury such as back injury.

- Assess the risk associated with the handling task.
- Use adequate handling methods and appropriate auxiliary handling equipment.

NOTICE

RISK OF PRODUCT DAMAGE DUE TO IMPROPER STORAGE

- Do not remove any packaging or protective covers until immediately before installation at the site.
- Store the product in a solid base in a dry, cool, and dust-free environment.
- Until its installation, protect it from the weather, dirt, corrosive atmospheres and other harmful influences.

RISK OF PRODUCT DAMAGE DUE TO LONG TERM STORAGE

Some product components may deteriorate with time (e.g. valve packings, seals).

- Do not store the product for more than 12 months.
- If, for any reason, the product must be stored for longer periods, contact VALSTEAM ADCA.

Products are individually wrapped in plastic film, thermo shrinkable plastic, and/or stored in a cardboard box as they leave VALSTEAM ADCA. Avoid removing packaging and any protective cover until immediately before installing the product at the site.

NOTE

If the transport packaging has any shipping damage, contact VALSTEAM ADCA or its representative.

Before storing and transporting the product, protect it from impacts and mechanical damage, paying special care to sealing surfaces and other fragile parts.

NOTE

If the corrosion protection (paint and other surface coatings) of the product is damaged during transport or other handling procedures repair it immediately.

4. INSTALLATION

Before performing any installation work, refer to section 1 – Safety information.

WARNING

RISK OF INJURY DUE TO INSUFFICIENT SUPPORT DURING INSTALLATION

Insufficient support of the product during installation may cause it to fall and cause personal injury.

- Ensure the product is safely held in place during installation.
- Wear protective safety shoes.

NOTICE

RISK OF PRODUCT DAMAGE DUE TO STRESS

The product is not intended to withstand external stresses that may be induced by the system to which it is being connected.

- Make sure that the connected pipe does not subject the body to any stress (forces or torques) during installation and operation.
- Do not use the product as an elevation point.

4.1. Preparation for installation

Before installation, make sure the following conditions are met:

- The installation area has easy access and the product is to be installed in a position where operation and maintenance work can be performed safely.
- The product will be installed with proper support and free of any stresses that can be induced by the system due to e.g. pipe expansions. The necessary precautions are recommended during system design.
- The pipeline where the product will be installed is designed in such a way that it takes into account the weight of the product. The pipeline may require support on both sides next to the product, particularly if its size and weight are considerable and especially if vibrations are to be expected in the system.
- The product is not damaged.
- Make sure all the necessary materials and tools are readily available during installation work.
- Referring to this Installation and Maintenance Instructions (IMI), Information Sheet (IS), and nameplate, check that the product is suitable for the intended installation: temperature, medium, pressure, etc. – see section 1.2 – Intended use.

- Check that there are no foreign bodies inside the pipelines and ancillaries, flushing may be necessary. These should be thoroughly cleaned.
- Check any mounted pressure gauges and make sure they function properly.
- Ensure adequate distance from quick-opening valves to prevent water hammer or shock loads.

NOTE

Assembly Drawings (AD) with assembly details and parts lists are available on request.

4.2. Installation procedure

1. Remove plastic film and other packaging, as well as the protective covers that are placed on flanges or connection ends. Make sure the strainer is free from foreign matter.
2. When the strainer is supplied with the optional drain connection, install a suitable ADCA blowdown valve at this point to allow safe and controlled draining and removal of debris.
3. Determine the correct installation position and direction of the fluid flow. The equipment has an arrow or inlet/outlet designation, be sure that it is installed in the appropriate direction.
4. Take care with jointing materials and sealing compounds to ensure that none may be permitted to block or enter the strainer. In case of flanged connections use appropriate flange gaskets.

5. START-UP

Before performing the start-up procedure, refer to section 1 – Safety Information.

The start-up procedure must be followed every time the product is put back into service.

5.1. Preparation for start-up

Before starting up, make sure the following conditions are met:

- All works on the system have been completed.
- All the necessary safety devices have been installed.
- When required, warning notices are used to alert others that the system is starting up.
- The product is correctly installed – see section 4 – Installation.

- Referring to these Installation and Maintenance Instructions (IMI), Information Sheet (IS), and nameplate, check that the product is suitable for the intended installation: temperature, medium, pressure, etc. – see section 1.2 – Intended use.
- A safety check was performed by qualified personnel. Checking for leaks, structural damage and integrity of system components.

NOTICE

RISK OF PRODUCT DAMAGE DUE TO CONTAMINATION

The plant operator is responsible for cleaning the pipelines in the plant as well as keeping the product well maintained. At start-up, the presence of small particles in the medium (dirt, scale, weld splatters, etc.) may damage the product or cause malfunction.

- Flush pipelines before start-up.
- Clean protection varnishes from pipes and flanges, leftover paint, graphite, grease, etc.

5.2. Start-up procedure

1. Open shut-off valves slowly, until normal operating conditions are achieved. This will prevent sudden surges of pressure that can damage the strainer.
2. Depending on the medium this will also avoid thermal shocks by bringing the product slowly up to temperature.
3. Check for any leaks.

NOTE

24 hours after system start-up, it is recommended to check the pipe connection for leaks and retighten when necessary. Clean strainers/filters to avoid blocking.

6. OPERATION

Before operating the product, refer to section 1 – Safety information

Immediately after completing the start-up procedure, the product is ready for operation.

WARNING

RISK OF BURNS FROM IMPROPER BLOWDOWN OPERATION
Hot or pressurized fluid can be released unexpectedly if the blowdown point is opened unsafely, creating a risk of serious burns or injury.

- Operate the blowdown valve from a safe position.
- Ensure all personnel keep clear of the discharge path.
- Ensure that protective equipment suitable for hot fluid exposure is worn.
- If a blowdown valve is not installed, the system must be fully depressurized before removing the plug.

7. SHUTDOWN

Before performing the shutdown procedure, refer to section 1 – Safety information.

7.1. Shutdown procedure

1. Switch off the system and secure it so it cannot be turned on by unauthorized personnel.
2. Fully close the upstream shut-off valve, to stop the process medium from flowing through the strainer.
3. Make sure the pipeline and the product are not under pressure and are at a safe temperature.
4. Allow medium to cool down and completely drain it from the pipeline and strainer.
5. Fully close the downstream shut-off valve.
6. If the strainer is to be removed from the pipeline – see section 3 - Transport, storage and packaging.

8. PARTS LIST

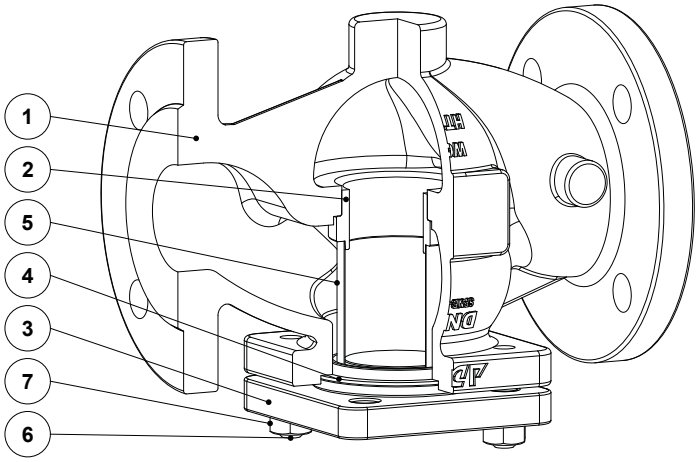

Fig. 2

POS. No.	DESIGNATION	SPARE PARTS
1	Body	
2	Centering ring	
3	Cover	
4	Gasket	X
5	Strainer screen	X
6	Stud	
7	Nut	

9. MAINTENANCE

Before performing a maintenance procedure, refer to section 1 – Safety information.

The product requires maintenance to ensure that it operates correctly and safely throughout its lifetime. Maintenance work should be performed in a planned manner at periodic intervals. These intervals must be defined by the operator according to the service conditions.

9.1. Maintenance procedure

1. Make sure all the necessary materials and tools are readily available during maintenance work.
2. Perform the shutdown procedure – see section 7 – Shutdown.
3. Perform the maintenance procedure – see the following sections.

4. Put the strainer back into operation – see section 5 – Start-up.

9.2. Cleaning and replacing the screen

1. Undo the nuts (7) gradually in a crisscross pattern and separate the cover (3) from the body (1).
2. Remove the body gasket (4) and clean surfaces thoroughly, leaving no remaining graphite leftovers.
3. Withdraw the strainer screen (5) from the body (1), avoiding any damage to the mesh.
4. Inspect the screen (5) for impurities, corrosion, or mechanical damage.
5. Clean the screen using water, compressed air, or a soft brush. If the strainer screen shows signs of mesh deformation or tearing, corrosion, pitting, blockage or embedded particles, replace it immediately to ensure proper filtration and to prevent damage to downstream equipment.
6. Check the condition and correct positioning of the centering ring (2) and clean all contact surfaces.
7. Reinstall the strainer screen (5) into the body (1) and a new body gasket (4). Refit the cover (3), ensuring correct positioning of all components.
8. Tighten the nuts (7) evenly in a crisscross pattern with the recomended torque – see section 9.3 – Tightening torques.

NOTE

The strainer screen must be cleaned periodically to prevent excessive pressure drop and ensure proper flow through the system. The cleaning frequency depends on the level of contamination in the process fluid.

9.3. Tightening torques

POS. No.	DESIGNATION	TORQUE (Nm)		
		1/2" to 2" – DN 15 to 50	21/2" – DN 65	3" and 4" – DN 80 and 100
6, 7	Stud and nut	4 x M12: 50	6 x M16: 120	8 x M16: 120

10. TROUBLESHOOTING

Before applying any corrective measure, refer to section 1 – Safety information.

If the malfunction cannot be solved with the help of the following table, contact VALSTEAM ADCA or its representative.

MALFUNCTION	POSSIBLE CAUSE	CORRECTIVE MEASURE
Flow is poor.	The screen is clogged with impurities.	• Remove and clean or replace screen – see section 9.2 – Cleaning and replacing the screen.
	The screen aperture is too small.	• Install a screen with adequated larger mesh size. • Contact VALSTEAM ADCA or its representative.
	The flow rate is higher than design conditions.	• Verify system sizing; reduce flow if necessary.
Leakage between body and cover.	The gasket is damaged or improperly seated.	• Replace gasket, check flange aligment and retighten nuts with the recommended torque – see section 9.3 – Tightening torques.
Loud noise or vibration.	Foreign matter is stuck in strainer.	• Remove object and check screen integrity.
Fluid bypassing strainer.	The screen is damaged or incorrectly installed.	• Replace or reinstall screen correctly.
Leakage through drain plug.	Drain plug or seal are worn or damaged.	• Replace plug or sealing elments.

11. DISPOSAL

Once the product has reached the end of its working life, it should be sent for disposal in accordance with the prevailing national and local regulations.

Before disposal make sure that the product is clean and free from fluid residues.

During its disposal, pay special attention to rubbers, resins and polymer components (PVC, PTFE, PP, PVDF, FKM, NBR, etc.).

Do not dispose of components and hazardous substances together with household waste.

12. RETURNING PRODUCTS

Information regarding hazards and precautionary measures to be considered due to contaminating fluids and residues or mechanical damage that may represent a health, safety or environmental risk must be provided in writing when returning products to VALSTEAM ADCA.

WARNING

RISK DUE TO THE PRESENCE OF HAZARDOUS RESIDUES ON RETURNED PRODUCTS

Contaminated fluids and residues may represent an environmental risk, or risk to VALSTEAM ADCA personnel.

- Information regarding any hazards or precautionary measures to be considered must be provided in writing when returning products to VALSTEAM ADCA.
- Health and Safety information sheets relating to any substances identified as hazardous or potentially hazardous must be provided outside the packaging.
- Use Hazmat labels on the packaging.

IMPORTANT NOTE

Total or partial disregard of these Installation and Maintenance Instructions involves loss of any right to warranty.

The extent and warranty period are specified in the “General sales conditions”.